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HAWAII COUNTY IN 1981

A Report by the Research Division *September, 1981*

In 1981, the effects of three consecutive years of steady deterioration in tourism are finally beginning to wear down the Hawaii County economy. The year 1979 was a turning point in Hawaiian tourism, beginning with the strike against United Airlines, the grounding of the DC-10s, and the steady increases in air fares dictated by sharply rising fuel prices. Hawaii County suffered its first downturn that year, seeing the number of visitors drop by 5.3 percent. Last year was even worse, with the visitor count down 11.6 percent. But for the first seven months of 1981, the number of visitors was down a devastating 19.9 percent from a weak 1980.

In addition to the deep slump in tourism, the county this year is feeling the effects of the sharp drop in sugar prices, reduced federal funds for the county and for energy research, and the severe drought in the first seven months. Hotel employment held up extremely well in 1979, 1980, and through the first quarter of this year in spite of the slump. But after months of slippage in occupancy rates, hotels were finally forced to do some trimming, and employment fell more than 10 percent in the second quarter. Employment in other areas is suffering, too, and the result is finally showing up this year in the climbing rate of unemployment for the county. Employment showed an improvement in 1980 despite the decline in tourism, helped by upbeat years in sugar and diversified agriculture. The average unemployment rate of 6.7 percent in 1980 was a 10-year low. However, the rate has shot up this year, climbing to 8.5 percent in July, the highest in the state.

The construction industry has been feeling the impact of declining tourism, high interest rates, and tight government budgets, all of which have eaten away at construction volume. Private building permit volume in 1980 was up 30 percent but public contracts awarded dropped 10 percent. Residential permits increased by 18 percent to $108.4 million, and nonresidential permits shot up 83 percent to $37.6 million. But for the first seven months of 1981 residential building permit volume is down 17.2 percent and public contracts awarded have declined 23.6 percent. Nonresidential permits continue to forge ahead, with volume up 70.6 percent, thanks to a lot of commercial construction in progress with financing arranged before the high rates were in effect.

Although Hawaii County's economy has declined more than any other county's, many Big Island business and government leaders are optimistic about the island's prospects for this decade. The County administration and private industry agree that the way to long-range success for Big Island tourism is to attract the independent traveler and to get a bigger share of the incentive market. They jointly sponsored a radio promotion to sell the Big Island to Californians during August, and they will participate also in the Hawaii '82 promotion to attract visitors to the state. The new resorts rising along the Kohala Coast and those in Kona will be the key to attracting independent visitors to the island. The just-opened Sheraton Royal Waikoloa's spacious meeting facilities and the Kona Surf's convention center now under construction will go a long way to make the Big Island an attractive area for meetings and related group functions in the years ahead.

Other activities that brighten the island's future are sugar, diversified agriculture, renewable energy, and astronomy. Sugar suffers from low prices in an unstable world market, but the island's plantations have raised their operational efficiency tremendously. In addition, they are producing more bagasse-fueled power, which is not only an added source of revenue but is drastically reducing the consumption of fuel oil. Continued gains in diversified agriculture are seen as the State opens up more lands for agricultural parks. The start-up of the first geothermal power generating plant and the heavy investments being made by private industry in exploration for more geothermal steam will give the island an energy base that is expected to spawn other industries. The value of the summit of Mauna Kea as an unequalled base for the study of space is being recognized more and more. Advanced instruments could be located there in the coming decade to expand this clean research activity still further.

Because of such potential, the County administration is confident of being able to provide for long-range needs. But it is skittish about the more immediate budget picture, as most local governments are, because of the slash in federal grants. In the last three fiscal years, federal grants made up between 18 and 25 percent of Hawaii County's annual operating revenues. The County is hoping for more revenue-sharing grants from the State which itself has a new constitutionally imposed spending ceiling. The County is looking into the possibility of raising the motor fuel tax and user fees although it doesn't expect to raise much from these sources. Real property taxes are a more promising source for the Big Island because it has more undeveloped land and water resources than any other county. Land development was most active on Maui and Oahu in the 1970s, and it could be Hawaii County's turn to lead in this decade. The tax assessor's gross valuation of Big Island real property increased $831.6 million between 1970 and 1975, and only $456 million between 1975 and 1980. For Maui and Oahu, the increases were much bigger in the second half of the decade. The rapid development of the leeward coast of the Big Island will expand the tax base and provide the County with much needed revenues in the 1980s.

RENEWABLE ENERGY

The coming on line of the geothermal generating plant at Pohoiki into the Hawaii Electric Light Co. (HELCO) system on July 17, 1981, was of historic importance, coming nine years after the State Legislature appropriated funds to check out the feasibility of developing Hawaii's geothermal resource. This makes Hawaii only the second state, after California, to have geothermally generated electricity as part of its power system.

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This is only a small demonstration plant of three-megawatt capacity, but it has proven that the resource in Puna is of high quality and that the potential capacity of this field appears to be extensive.

HELCO, a subsidiary of Hawaiian Electric Co., will operate the Pohoiki plant under contract to the Research Corporation of the University of Hawaii (RCUH). It will purchase the power at a price based on the average cost of fuel and the price of purchased power during the previous calendar year. HELCO estimates that this plant's output of 24 million kilowatt hours a year will be able to supply between 2,000 and 3,000 homes. The excess of revenues over expenses will go to the RCUH for further geothermal research. RCUH has a contract with the Department of Energy to oversee the plant through 1990.

Private industry will now prove out the extent of the steam resource and then develop the field. Three groups have responded to a proposal from HELCO for a minimum 25-MW-capacity generating plant. They are Barnwell Industries, Puna Geothermal Joint Venture, and True/Mid-Pacific Geothermal Venture.

Barnwell has completed the drilling of two wells, and has permits for more wells, mostly in the Pohoiki area of Kilauea Volcano's east rift zone. It has stated publicly that it will offer its power at 10 percent below normal cost.

Puna Geothermal is a three-way partnership with Thermal Power Co., a subsidiary of Natomas Co., holding a 50 percent interest, Dillingham Corporation having a 25 percent interest, and Amfac Inc. having the remaining 25 percent. This joint venture has leased land in the Pohoiki area and also has 4,000 acres owned by Amfac in the rift zone that will be held in reserve. Drilling of the first well is expected to get under way before the end of the year and a second well will follow. The wells will then be tested and if found to be feasible, plans for a generating plant will begin and drilling of further wells will continue. The price Puna Geothermal will charge for its power will be competitive, the company said, so it will depend on the cost of development. HELCO's most efficient oil-fired plant has an installed cost of $200 per kilowatt of capacity, whereas a geothermal plant will cost between $2,000 and $3,000 per kilowatt. But a geothermal plant will have no fuel cost.

True/Mid-Pacific Geothermal is a joint venture of True Geothermal, Mid-Pacific Geothermal—both Wyoming companies—and Campbell Estate. This group will explore for geothermal energy on Campbell Estate land that stretches along the east rift zone from the eastern end of Kilauea Volcano all the way to the shoreline at Queen's Bath. The initial prospect site is Kahauale'a at the 2,000 to 2,500-foot elevation, and will represent less than 3 percent of the estate's more than 26,000 acres there. A rig with the capability of drilling to a depth of 12,000 feet will be shipped to the Big Island for the exploration.

HELCO, under its proposal, will have to decide by November 1, 1981, which of the three groups it will pick as the most capable of supplying the minimum 25-megawatt capacity by 1987. HELCO will not need another generating plant until 1993, and it is hoping that the proposed geothermal plant will make another oil-fired plant unnecessary. A national law (PURPA) requires the utility to purchase all alternate energy offered, and there may be a problem if all three groups are able to develop substantial geothermal capacity. The answer could be a breakthrough in deep-sea cable technology so that excess power can be exported to Oahu where the biggest demand for power will be for many years.

Research on cable technology had started a year ago, but funds were cut off by the Reagan Administration. However, Congress is keeping it alive, and there is a bill in both houses which, if it passes, will provide the funds to continue this work. In the meantime, the State has provided $600,000 toward the effort, with Hawaiian Electric Co. as prime contractor.

HELCO also has a contract with Windfarms Ltd., which will supply power from a wind energy generating machine to be built in North Kohala. The 4-MW-capacity plant will supply 20 million kilowatt hours annually. Power from Windfarms is expected to go on line in 1983.

When wind power becomes available, HELCO will meet more than half of its power requirements with alternate energy sources. Wind power will provide 4 percent of its requirements, and geothermal energy another 5 percent. In 1982 HELCO will get 38 percent of its power from biomass energy, and another 4 percent from hydroelectric sources. This will be a total of 51 percent to be derived from non-fossil fuel sources, increasing to 75 percent in four to six years with the successful development of geothermal resources by one of the three development groups.

OTEC (ocean thermal energy conversion), another promising alternate energy resource, has been slowed down considerably by budget slashing at the federal level. As a result, most all OTEC projects will be closed down, but the Seacoast Test Facility at Keahole Point will be a prime candidate for funding of those that remain, and scientists are confident the Keahole work will continue. The State has invested large sums, and is building the test facility in a six-acre enclosed compound, but has set aside 320 acres in all. Because the net efficiency of the OTEC process is low, it is vital that anything tending to reduce the efficiency of the system be contained. The Keahole facility is studying biofouling and corrosion of the heat exchangers, alloys and metals best suited as heat exchanger material, heat loss during transfer, and bacterial growth in the mechanism and its control. Another project calls for laying a 6,600-foot pipe to bring in nutrient-rich cold water from the deep to test it for marine farming. The center will also look into the desalination of sea water. Research on solar energy options is also on the future activities list. The Seacoast Test Facility essentially wants to have users—private firms, foreign countries, etc.—rent space and conduct their own studies at a site that offers such advantages as a lot of sun, open space, deep ocean, and easy access.

TOURISM

Hawaii County suffered a decline in the number of visitors in 1979 preceding the state as a whole which skidded into a decline in 1980. There appears to be some recovery in the other countries this year, but the Big Island is headed into its third and possibly worst decline. The number of visitors to Hawaii County in the first seven months of 1981 totaled 379,465, which was down 19.9 percent from the first seven months of 1980 while the decline for the state as a whole was only 2.3 percent. Occupancy for Big Island hotels through July averaged 49.4 percent, a new low. The addition of 154 new units in the first half did not help the occupancy rate, and the opening of the 543-room Sheraton Royal Waikoloa Hotel in July may hurt occupancy even more this year.

Although the number of visitors flying in has declined steadily, those coming by ship have added some lift to Big Island business. The Oceanic Independence anchors off Kailua-Kona one day a week, and the Kona Coast Chamber of Commerce is thankful for the 600 weekly visitors. It offers a weekly welcoming program followed by an unescorted walking tour of the town to see historic and other points of interest. The Chamber wants to change that into an escorted tour next year. Business definitely picks up in the small town during the ship's 10-hour stopover.

In an attempt to stop the current slump, the County joined with Aloha, Hawaiian, and United Airlines in a $150,000 radio promotion in California during July to further tap Hawaii's best market. The County is also planning its own promotional program simultaneously with the Hawaii '82 program being sponsored by government and private industry.

The county is counting on destination areas rising along the leeward coast to finally establish the Big Island as a major resort destination area in its own right and revive tourism for the Big Island. The consensus for a remedy appears to be to attract the FIT (free and independent traveler) and the sales incentive tours. To this end, the second top-quality hotel for the Kohala Coast was opened last July, and another is under construction. There are four championship golf courses in the South Kohala destination area, another in Keauhou-Kona, and plans for several more. The Royal Waikoloa and the Francis H. I'i Brown golf courses were opened this past summer. Both were built on lava, and the former took eighteen trucks six months to haul sufficient soil to top the lava for the layout, and the latter hauled half a million cubic yards of soil for the golf course. These and numerous other outdoor facilities including beach and ocean activities are expected to appeal to the visitor to the Big Island in the years ahead. The newly opened Sheraton Royal Waikoloa is going after the incentive market very intensively, and it has the facilities to cater to that segment. The hotel ballroom is 6,400 square feet in size and can seat 650 for banquets or 850 theater-style. In addition, there are three other meeting rooms, each with a capacity of 95 seated theater-style or the three can be joined into one 2,118-square-foot room. The 11,000-square-foot terrace is available for cocktail parties or other activities, and there is an outdoor function area next to the Pool Terrace that will be able to accommodate 600 at a luau.

The Kona Surf Hotel, the mainstay accommodations facility of this sunny leeward resort coast, wants to increase its share of the incentive and meetings market. Its convention center, under construction and scheduled to open next March, will be the largest on the Neighbor Islands. The main meeting room will be nearly 10,000 square feet in size and will be able to seat 750 for banquets and 1,000 for meetings. There will also be a smaller break-out meeting area. Both can be divided to make four smaller meeting rooms. Combined with the meeting rooms now in the hotel, eleven separate meeting areas will be available. The new convention center will also have a 9,500-square-foot reception area.

The Sheraton Royal Waikoloa Hotel was opened on July 6. It is the first hotel at the Waikoloa Beach Resort and rises six stories back of the Royal Fish Pond directly behind the beach at Anaehoomalu Bay. The hotel has 523 rooms and suites, and a separate two-story building next to the fish pond has 20 additional suites. The hotel hired 200 for the opening and ultimately will have 450 employees. Hotel management is looking toward a 35 to 40 percent occupancy for this year, with a big improvement next year as the incentive market begins to grow. Owner/developer of the hotel is TAAS Associates, a joint venture between Transcontinental Development Co., ATPAC Land Co., Aetna Life Insurance Co., and the Sheraton Corporation. Sheraton Hawaii Management Corporation is the operator of the hotel.

Transcontinental Development Co., which owns the 500-acre resort and the other Waikoloa lands, will operate the Royal Waikoloa Golf Course and the beach facilities. It will begin planning a second hotel or a condominium project next year. The resort is zoned for six hotels.

Mauna Lani Resort Inc. opened its Francis H. I'i Brown Golf Course in July and a 350-room luxury hotel is now under construction. Also being developed are 80 luxury condominium units. Both will be ready for occupancy late next year. THI Hawaii Inc., owner of the Hawaiian Regent Hotel in Honolulu, will operate the hotel. Mauna Lani Resort owns 3,200 acres of land and long-term plans call for a resort community of six hotels, sixteen residential clusters, two historic preserves, and recreational, shopping, and entertainment facilities. Like the other two resorts along the Kohala Coast, Mauna Lani will be developed with historic and environmental values to be preserved.

Mauna Kea Land Corporation, a subsidiary of UAL Inc., is planning two low-density, high-quality developments on the north side of Mauna Kea Beach Hotel. One will be a 32-lot project of a half acre or more each on 66 acres of land on the north side of the main entry road to the resort. The other is a 38-unit luxury condominium project on 27 acres of land on the opposite side of the entry road but further toward the ocean. Work will begin as soon as necessary governmental approvals are received.

Cambridge Pacific Inc. has committed itself to preserve Kona Village in its present state and plans to dedicate 50 acres of land around the village, which are zoned urban and intermediate resort, back to conservation. In exchange, it is planning to ask the State Land Use Commission to reclassify 50 acres a mile and a half up the coast to urban so that it will be able to build a 350-unit condominium hotel and a golf course. About three-fourths of a mile south of the village it plans to develop 50 luxury condominium units.

Having successfully drilled a well at the 1,300-foot elevation, Cambridge Pacific Inc. is developing a 5,000-acre agricultural subdivision of five-acre lots. The lots will be priced at approximately $175,000 with a 65-year lease from the Bishop Estate. The well has a capacity of 900,000 gallons of water a day and will be sufficient for the subdivision as well as for the firm's present and proposed developments along the coastline.

Kamehameha Investment Corporation, the new name of Bishop Estate's land management subsidiary, has been seeking zoning changes from County agencies for the development of the second section of its Keauhou-Kona resort community, and for a large hotel planned at the head of Keauhou Bay in the first section. The second section has a total of 880 acres.

Mahukona Properties has submitted an environmental impact statement to the County Planning Department covering its proposed development of 1,043 acres along the west shore of North Kohala into a resort community. The project calls for 1,500 hotel rooms, 3,500 condominium units, 500 single-family residential units, and a commercial area.

AGRICULTURE

Total receipts for crops and livestock at the farm level in Hawaii County passed the $200 million mark for the first time in 1980. An increase of 48.5 percent sent receipts to $215.5 million from $145.1 million in 1979. The reason for the large increase was high sugar prices during 1980. Harvested cane was valued at $137.5 million, up 73 percent from 1979 but substantially below the record $165.4 million in the boom year of 1974. Receipts for diversified agriculture continued to increase solidly, reaching $78 million in 1980 for an 18.8 percent gain. Almost all of the gain was accounted for by diversified crops, whose value increased 25.2 percent to $55.5 million, while livestock sales rose only 5.4 percent to $22.4 million due to a mediocre year for beef cattle.

Macadamia Nuts

In 1980, the production of macadamia nuts continued the tremendous increase of the previous year. The heavy production and sharp increase in the average price received pushed the value of sales to $24 million, a more than doubling in two years. Almost the entire state crop is grown in Hawaii County, and although some acreage is being added on Maui, there will be no harvest there for another five years. The industry performance last year was aided by an increase in the number of bearing acres, a substantial increase in yield, and a sharp increase in farm price. The number of acres planted in macadamia nuts on the Big Island increased 10 percent to 12,210 acres while the acreage bearing rose 8 percent to 10,370. Yield per acre was up 14 percent to 3,200 pounds for a total production of 33.3

million pounds of nuts. The farm price for the nuts jumped 15 percent to an average 72.4 cents a pound, returning farm receipts totaling $24.1 million compared with sales of $16.7 million in 1979.

Growers are expecting a larger crop in 1981, but the increase is not expected to be as big as last year due to dry conditions in the major growing areas of the county. The Honomalino area, for example, got only half the rain in the first six months of the year compared with the first half of 1980. Moisture has been deficient, too, in the Ka'u, Keaau, and Hamakua areas.

The number of nut-bearing acres on the Big Island increased almost 50 percent in 1978 to 9,180 acres, and by the end of last year had gone up to 10,370 acres. Yield dropped in 1978 to 2,300 pounds per acre because of the large number of newly bearing trees, but has increased smartly to 2,800 pounds in 1979 and to 3,200 pounds last year.

Mac Farms of Hawaii Inc., the second largest grower on the island, has been sold to CSR Ltd., an Australian firm based in Sydney. Management of Mac Farms is expected to remain unchanged. It has 3,100 acres in macadamia nut trees in Honomalino of which 2,700 acres are bearing.

Mac Farms has five harvesting machines that shake the trees and catch the nuts in what appears like an upside-down umbrella that wraps around the trunk. Lower branches of the trees have to be trimmed to let the machine get to the trees. The machines are equipped with lights and can harvest 24 hours a day if necessary. The machines are used during the high-yield periods for low-cost operation. The yield is too low during the beginning of the harvest season and toward the end for machine harvesting. Gathering of nuts by vacuum supplements mechanical harvesting because the ground there is almost entirely lava. Last year 35 percent of the production was mechanically harvested. Mac Farms wants to increase this to 45 percent, and is experimenting with ripening agents so that more of the nuts on the trees will mature together for the most efficient harvesting. The processing plant has been completed, and Mac Farms last year produced 4.7 million pounds. The raw, dried kernels are sold to nut and candy manufacturers in the state.

The Mauna Loa Macadamia Nut Co., the largest grower and manufacturer of macadamia nut products, added more than 1,000 acres of new plantings last year. It should complete its 5,000-acre expansion program by the end of next year. About 1,200 acres will be on C. Brewer land on Maui. The company introduced butter-glazed macadamia nuts last year. This year it has come out with coconut and Kona coffee flavored nuts, giving it two more consumer products.

Although foreign production of macadamia nuts is becoming a factor in the marketplace, demand for Hawaii-produced nuts is still good. However, producers in Hawaii agree that heavier promotion will be required to market the rapidly increasing production in the face of emerging competition.

Flowers and Nursery Products

Statewide the increase in production of flowers and nursery products in 1980 was the largest ever recorded, with the total wholesale value jumping 32.1 percent to $27.4 million from the previous year's $20.8 million. All seven sectors of this business showed increases of better than 20 percent except for cut orchids, which increased 11.7 percent. The biggest sector was potted plants, whose value was up 31 percent last year to $10.9 million, followed by cut flowers, which was up 23.4 percent to $9.3 million. Anthurium sales increased 23.5 percent to $6.9 million, accounting for the bulk of cut flower sales. Another significant sector was lei flowers, whose wholesale value amounted to $3.2 million, an increase of 25.7 percent over 1979.

Of the total production last year, out-of-state exports amounted to $14.1 million, a little more than half the total production value. This was 18.2 percent more than the value of 1979 exports and double the value of 1977 exports. The largest export was the anthurium, valued at $6.6 million, followed by potted foliage plants at $3.3 million, unfinished and other potted plants at $1.4 million, and potted orchid plants at $[illegible] million.

Hawaii County accounted for the largest production (by wholesale value) of flowers and nursery products last year with sales of $12.1 million, which was 44 percent of the state total. Sales were 23.6 percent more than in 1979. Making up more than half of Hawaii County's 1980 production was the anthurium, which brought growers $6.6 million, and in second place was foliage and other potted plants at $2.3 million. The foreign market for anthuriums exploded in the 1970s with the accelerating demand from Europe—mainly Italy, West Germany, and Switzerland. This market is beginning to peak, however, due to the strong U.S. dollar, so now Big Island growers are making greater marketing efforts on the Mainland and in Japan.

Last year growers shipped 608,000 dozen anthuriums to Italy, 300,000 dozen to West Germany, and 127,400 dozen to Switzerland. In the first six months of 1981, shipments to Italy are down 15 percent, to West Germany, down 44.7 percent, and to Switzerland, down slightly. Japan imported 329,300 dozen last year, and in the first six months of this year, shipments there are up 68.5 percent. The Mainland has long been a flat market for anthuriums, but last year took 483,400 dozen, an increase of 16.8 percent over 1979 deliveries. For the first six months of this year, Mainland shipments are up 10.8 percent.

Sugar

The sugar cycle crested in 1980, and returns to growers were the best in six years with the average price rising to $554 a ton. For the 1,023,232-ton state crop, revenues were $566.4 million, an increase of 75.8 percent over 1979 sales of $322.2 million. The average price for molasses jumped 22 percent to $87.90 a ton last year, for a total of $27.7 million which combined with sugar revenues returned $594.1 million to the industry, somewhat less than the earlier estimate of $631 million. The 1980 crop was not completely sold until around May of this year, and unexpectedly sharp drops in sugar prices this year reduced the 1930 revenue figure.

Plantations in Hawaii County produced 367,046 tons of sugar last year, the smallest crop of the past decade. Heavy winter rains early in 1980 were a major cause of the small crop as two plantations were not able to complete their harvests. Revenues of $202.9 million for sugar and $9.3 million for molasses gave the industry a total of $212.2 million for the year.

Winter rains were not as destructive in Ka'u and the Ka'u Sugar Co. achieved a record year as well as being number one in the industry for 1980. It produced a record 63,181 tons of sugar with a yield of 13.09 tons of sugar per acre (13.14 tons by the plantation and 10.13 tons by independent planters) which was the best in the industry. Ka'u Sugar also was the lowest-cost producer in the state. However, the drought is affecting its sugar cane this year and future crops could suffer.

Ka'u Sugar will install a new mill during the off season that will upgrade juice extraction substantially next year and raise yield. The company is also planting 2,000 acres of macadamia nut trees as part of C. Brewer's 5,000-acre macadamia nut expansion program. This will be diversification for the company and help cushion those years when sugar prices are low. Mauna Loa Macadamia Nut Co., a Brewer subsidiary, will process and market the nuts.

The Hilo Coast Processing Co. (HCPC), plagued with problems a few years ago, is continuing to overcome adversities and is transforming its factory into a very efficient entity. Investment in a new washer solved a milling problem and eliminated the need to dispose of trash, which is now used as fuel for the

boiler. Another investment in a dryer, which uses heat from the smokestack, is reducing moisture from bagasse to 35 percent from the previous 50 percent, resulting in a fuel with much more heat value. These efficiencies will save the factory from burning 45,660 barrels of oil annually. The company is delivering 100 million kilowatt hours of power a year to the Hawaii Electric Light Co. In sugar operations, yield for the first six months was 10.44 tons of sugar per acre, which is 1.14 tons better than for the same period in 1980. This performance made Mauna Kea Sugar Co., which with 300 independent growers owns HCPC, one of the low-cost producers last year after several years at the highest-cost end of the industry scale.

Davies Hamakua Sugar Co. has been hit by a drought that could affect the yield of its 1983 crop. It gets 195 inches in a wet year and over 100 inches in a normal year, but for the first six months of 1981, only 11 inches of rain had fallen. Sugar cane requires 60 inches of well-distributed rain for normal growth, and all but 6,000 of its 34,000 acres depend on rain for moisture.

Davies Hamakua is doing much better with its renewable energy program. It dedicated a bagasse-pelletizing plant and a new 7.5-megawatt generator at the Haina factory. The pelletizing plant uses the Woodex process and the storage capacity is 20,000 tons, equivalent to 50,000 barrels of oil. When bagasse is turned into pellets, it is a dry, compact, high-quality fuel that stores well. The joining of the generating plants at the Haina and Ookala factories combined with the stored pellets will make it possible for Davies Hamakua to supply power to HELCO year-round. It will export 40 million kilowatt hours of power on an annual basis, and once the operation of the pelletizing plant is thoroughly proven, power export will be stepped up to 52 million kilowatt hours. The company now has a generating capacity from its two factories of 24.8 megawatts.

Puna Sugar Co. is also suffering from the drought this year, getting less than half the normal 130 to 140 inches of rainfall for the first six months. Saddled with the lowest yield in the industry, the company has started a program of open line planting. In this operation a man monitors the mechanical planter to be sure that all the seed cane is in place, and where it isn't, the seeds are dropped manually. The result has been better stands of cane, which should bring about higher yields than the 8 tons of sugar per acre the plantation has forecast for this year.

Cattle

Hawaii County produces more than half of the state's beef, so when its production is good, so is the state's. It was a poor year for the state in 1980, but higher prices helped the industry maintain sales at close to the 1979 level—$28.1 million, down from $28.4 million in 1979. However, revenues from beef still ranked number one in diversified agriculture. Hawaii County marketed only 34,500 head of cattle last year, a drop of 2,500 from 1979, a result of the final liquidation stage of the cattle cycle and the drought-caused low production of calves in 1977-78. However, the average weight of the animals was higher last year and total live weight of the animals sold was 33.2 million pounds, up slightly from the previous year. The average price for 1980 was $54.20 a hundredweight, up $1.70 from 1979, and the year's sales amounted to $18 million, compared with $17.3 million in 1979.

The disappointing performance was due to the low price received for grass-fed cattle as competition from lower-priced beef from overseas intensified. Big Island ranchers marketed 16,900 head of grass-fed animals, down 1,300 from 1979, but total live weight was 14.7 million pounds, up around 400,000 pounds. The average price for the year was $47.60 a hundredweight, only 20 cents better than the 1979 average price. The value of sales totaled $7 million, up from $6.8 million in 1979.

Compensating for this was a much better price for grain-fed cattle. Both the number of cattle sold and total weight were down—17,600 cattle sold, down 1,200 from 1979, and 18.4 million pounds total weight, a decline of 200,000 pounds—but value of sales was $11 million, an increase from $10.5 million in 1979. Average price was $59.50 a hundredweight, up $3 over 1979.

The prolonged drought in Honokaa, South Kohala, and Ka'u this year, will have an effect on 1981 production. Lack of the winter rains that normally replenish the ranges on the leeward side of the island, and the severe reduction of trade wind showers in the first six months of the year sharply reduced the amount of grass and water available to the herds.

Ranchers have had to use supplemental feed and send some of their animals to the feedlot in order to save them. This will raise their production cost. At the height of the drought, a million gallons of water were being hauled daily to the thirsty herd. At 1.5 cents a gallon, the cost of hauling water was around $15,000 a day for the hard-pressed ranchers. An animal drinks 10 gallons of water normally, but needs about 15 gallons during dry weather. Parker Ranch, the largest in the state, is seeking approval to replace its old pipeline from the Kohala Mountains to get the full amount of water it is permitted to use daily, and has plans to build more reservoirs around its ranch to store water.

More of the cattle are being prepared for market right on the island than ever before. Miko Meat Corporation, since its purchase by Goehring Meats Inc. in 1976, has doubled its beef slaughter. It opened its new slaughterhouse this past spring, the first plant on the Big Island that has federal inspection. It is handling up to 15 animals a day, and has the capacity to double that production. Organ meats are sold through regular channels, and the bones are sold for fertilizer rendering. Hides, together with those the company buys from other slaughterhouses on the island, are shipped to Japan. This is the first plant on the island where most of the animal is used commercially. Miko feeds up to a thousand head of cattle at several locations. It buys calves from local ranchers for fattening. It is feeding the animals for 90 days instead of the normal 120 days, to meet the market demand for lean beef. The lowered feeding cost helps the firm hold prices down. The processed meat volume has increased with higher beef production. Portuguese sausage and hot dogs are in greatest demand. Miko also distributes a large volume of pork and pork products, which are the major products of the parent company.

Papaya

Papaya production recouped nicely in 1980 after a storm-damaged drop in the 1979 crop. Statewide production totaled 48.9 million pounds in 1980, up 19.3 percent from 1979. Fresh fruit shipments showed an even better recovery for the state's growers, with 45.4 million pounds shipped last year, a gain of 24.5 percent over 1979. But a reduced average price pushed up the total value of sales only 4.9 percent to $10 million.

Hawaii County had a crop of 41.3 million pounds or 84.3 percent of the total state production. This was an increase of 35 percent over 1979 production, but fresh fruit shipments jumped 40 percent to 37.9 million pounds last year. The total value of sales last year amounted to $8.1 million, up 21.7 percent over the $6.7 million registered in 1979.

The Big Island produces more than 90 percent of the papaya puree manufactured in the state, but its output for 1980 was down slightly to 3.3 million pounds due to a heavy demand for fresh fruit. Puna Papaya Co. manufactures almost all of the puree at its new plant, which was installed last year at Keaau. The company purchased some fruit from other growers last year for processing, but its own production has increased sufficiently this year to supply the plant's needs. In the first half of this year, 28 percent of its production went for puree. The company is changing its processing to aseptic packaging of puree later this fall. The shift to this type of packaging will cost

the company $495,000, but there are several advantages to this heat-treated process that should increase the long-range profitability. Puree will be packed in 40-pound containers and will not require freezing as in the present process. The Vitamin C content is retained in aseptic packaging whereas it is lost in freezing. Aseptically-packed products have a long shelf life and so can be shipped longer distances at much lower transportation cost. Papaya puree is used mostly in drinks, but can be used in making bread, cookies, and confections such as the new papaya jelly bean. The frozen product did not lend itself well to use in confections, but the aseptically-packaged product presents no problems. The company plans to double its aseptic-packaging capacity which will make it possible to process as much as 40 million pounds of puree annually. This will make it possible for Puna Papaya Co. to process all of the papaya on the Big Island that doesn't meet the fresh fruit standard for export. The plant will also be able to process guava, passion fruit, and other fruit.

Coffee

Coffee production in Kona slipped badly last year as 50 farms left the business, leaving only 650 farms. Total acreage dropped to 1,900 from 2,100 last year, and only 1,700 of these acres were harvested. Yield per acre declined 25 percent to 900 pounds per acre. Total production was down from 2,190,000 pounds to 1,450,000 pounds. And the value of sales dropped from $3.1 million to $2.2 million.

To save the industry from going under, one more effort is being made to market Kona coffee as a gourmet item at prices substantially above that of the grocery-store grades. United Coffee Corporation started operations in the summer of 1980, reopening the old Fujino mill in Kainalu. It purchased about a third of the Kona crop last year, and shipped the processed coffee beans to its parent firm in San Francisco for roasting and marketing. United specializes in gourmet coffee from all over the world, and it reports that the demand for Kona is good. Its plan is to market Kona coffee only in gourmet shops and in gift packages to command the highest prices. It is hoping to buy more of the crop this year. The Kona Farmers Cooperative is expecting a much better crop this year among member growers as a result of favorable weather and good blooms. But it is not certain if all of the coffee will get harvested. The cooperative would like to market its coffee at higher prices, but it had not reached agreement at mid-summer with Superior Tea and Coffee Co., which has been buying the co-op's entire output.

Hawaii County Statistics

	unit	period	1976	1977	1978	1979	1980	7 mo.* 1981	% change 7 mo.* 1981/1980
Population, Resident	number	July 1	80,600	53,000	85,700	89,000	93,700	n.a.	—
Per Capita Personal Income	dollars	total	5,758	6,634	7,127	7,760	n.a.	n.a.	—
Civilian Labor Force	number	mo. avg.	35,800	36,500	35,900	35,400	35,450	36,350p	3.3
Employment	number	mo. avg.	31,750	33,100	32,300	32,550	33,050	33,450p	1.8
Unemployment	number	mo. avg.	4,100	3,350	3,600	2,850	2,350	2,850p	21.3
Unemployment Rate	percent	mo. avg.	11.4	9.2	10.1	8.1	6.7	7.9p	17.9
Total Job Count[1]	number	mo. avg.	33,000	34,100	35,400	36,300	37,000	37,000p	1.2
Tax Collections	thous. $	total	53,550	54,709	63,231	72,577	80,900	46,218	4.5
Total Bank Deposits	thous. $	end per.	215,668	235,232	262,759	306,791	359,438	346,128	5.8
Debits to Demand Deposits	mil. $	total	1,566.5	1,754.3	2,009.5	2,496.7	2,945.1	1,714.7	2.3
Private Permits									
Residential	thous. $	total	29,243	39,505	60,963	91,942	108,360	47,423	-17.2
Single Family	no. of units	total	921	1,070	1,382	1,429	1,192	643	-14.8
Multi-Family	no. of units	total	129	133	334	734	739	162	-59.8
Non-Residential	thous. $	total	10,505	11,850	13,408	20,547	27,598	49,345	70.6
Public Contracts Awarded	thous. $	total	38,696	26,884	26,263	46,965	42,543	15,002	-30.0
Federal	thous. $	total	560	7,806	4,156	2,152	1,924	3,489	2,511.6
State	thous. $	total	18,022	13,370	16,551	39,816	31,822	9,200	-51.0
County	thous. $	total	20,074	5,708	5,556	4,994	8,798	2,313	-7.5
Estimated Westbound Visitors	thous.	total	616.5	939.0	909.0	860.9	761.1	379.5p	-19.9
Intended Length of Stay—Westbound	no. of days	mo. avg.	3.05	3.13	3.25	3.40	3.46	3.58	2.3
Hotel Inventory	number	June	5,936	6,051	6,064	6,056	6,260	6,859	9.6
Hotel Occupancy	percent	mo. avg.	57.6	61.0	65.0	62.0	52.7	49.3	-11.0
Telephones in Service	number	end per.	52,746	55,941	58,661	62,322	66,405	68,331	5.1
Motor Vehicle Registration	number	total	57,151	60,374	63,025	67,718	70,047	n.a.	—
Sugar Production, raw sugar 96°	thous. tons	total	388	374	387	388	367	240	30.1
Diversified Agriculture	mil. $	total	41.6	44.2	54.7	65.6	78.0	n.a.	—
Crops	mil. $	total	25.8	28.9	34.7	44.4	55.5	n.a.	—
Livestock	mil. $	total	15.8	15.3	19.9	21.3	22.4	n.a.	—

p = preliminary **except hotel inventory (June)*

n.a. = not available *[1]Refers to number of jobs rather than number of persons employed. Persons with more than one job are counted more than once.*

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KAUAI COUNTY IN 1981

A Report by the Research Division *November, 1981*

In 1981, Kauai County is feeling the effects of an accelerating decline in its economy. Three consecutive years of progressively worsening visitor totals are beginning to weigh heavily on the island's business activities. The sugar industry would have countered part of the decline in tourism with its increased production, had it not been for a substantial drop in sugar prices which will make 1981 receipts a real disappointment compared to 1980 when sugar prices were high most of the year. Visitor arrivals for the first eight months of this year were down close to 9 percent compared to the same period in 1980.

This year's slide in tourism is sharper than the past two years, and has slashed deeper into the economy than those experienced during either of the last two national recessions of 1974 and 1980. Employment, for example, has lagged badly this year. The rate of unemployment had improved steadily the past four years to an average 4.9 percent in 1980. But for the first eight months of this year, the rate averaged 6.1 percent. Employment for the first eight months averaged 16,650, down 250 or 1.5 percent. For the month of August alone the number of jobs was down by 850 to 17,100 when compared to August 1980. The biggest drop has been in construction, where jobs declined from 950 in August 1980 to 550 this past August. Other decreases were recorded in the transportation, retail, and service industries, all casualties of the growing weakness in tourism. Although hotel employment figures showed a drop, they actually may have increased because the opening of the Waiohai in July and its new hires were not cranked into the state statistics.

The drop in construction, largely caused by high interest rates, may also be attributed in part to the weakness in tourism. The value of private residential permits issued for the first eight months was down 30 percent to $30.9 million. Permits for single-family construction fell slightly and multi-family permits were down substantially. Private non-residential permits also dropped, from $18.2 million last year, to $16.1 million this year. Public contracts awarded by the federal government and Kauai County were down by big margins from last year. Those awarded by the State were up only because of the start-up of the new north-south runway project at Lihue Airport. A diminishing volume of building permit applications at the County Planning Department indicates a continuing decline in construction for the rest of the year, and probably into next year.

Another major indicator of the declining economic condition is the gain in tax collections—the smallest in more than ten years. In the first eight months of this year the State collected $17.3 million (excluding property taxes which are now collected by the Counties and not by the State), up only 1.8 percent while the average annual gain for the past ten years has been in double-digit percentages. Retail activity has slowed down perceptibly, too, as indicated by general excise tax collections on the first seven months' sales which rose only 4.9 percent (far less than the inflation rate).

To counteract this economic erosion, the County administration has made revival of tourism its top priority, and has embarked on heavy promotion of the island in cooperation with the private sector and the Hawaii Visitors Bureau. It will step up its participation in trade shows and will conduct more familiarization tours for travel agents. A new travel poster has been created, and brochures on its museums and gardens have been published for use in the promotion. The County has also put together a multi-media slide show for use in trade and travel seminars and other promotional activities.

The administration is pushing for growth of the other sectors of the economy also, with master plans being developed for agriculture, fishing, and aquaculture, all three to be completed next year. The chairman of the County Council, Jeremy Harris, is also working toward the development of fishing, aquaculture, and diversified agriculture, and hopes to attract high-technology enterprises to Kauai in order to strengthen the base of the economy. He said the State is going to build an ice and cold storage plant in Nawiliwili as part of the infrastructure for the development of the fishing industry on Kauai.

Despite the subdued economic condition, many of the island's businessmen are rather optimistic about 1982. This feeling is shared by most of those in the hotel industry, especially by those at Poipu Beach resorts. The four major operators there are well along in their developments. They will promote the area jointly, and are quite encouraged about the prospects for next year.

Retail merchandising will be a new ball game next year with the opening of the 300,000-square-foot Kukui Grove Center in Puhi. The structure has already topped out and some of the stores will open as early as March 1982. The center tenants will include Liberty House with 50,000 square feet of space, Sears with 34,000 square feet, Woolworth with 40,000 square feet, Longs Drugs with 27,000 square feet, and Star Super Market with 30,000 square feet. Approximately 65 percent of the floor space has been leased. Adjacent to the center will be the 18-acre Kukui Grove Village which will open next summer. The Village will have a Burger King, financial services, a dental center, a commercial complex, and office buildings.

The closing of Kauai Stores left a void in the Lihue Shopping Center, but not for long, as GEM of Hawaii Inc. opened its first Kauai outlet there in mid-August, and was doing a brisk business in the initial weeks. The Market Place at Coconut Plantation has seen its sales move fairly closely with the visitor arrival pattern over the past several years. But sales in the second quarter of this year rose above the visitor traffic trend, which possibly could be explained as a shifting of customers to the Market Place after the closing of Kauai Stores and Kress Store in Lihue. Most of the ground floor of the former Kress Building is now occupied by BJ Furniture, a Honolulu furni-

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ture chain that is expanding statewide.

Kauai's involvement with the nation's space program continues but at a slightly reduced rate. Due to the slash in the federal budget, NASA's Kokee tracking station suffered a 25 percent cut in personnel in August. The station will now conduct its mission with a staff of 75. The station went on a one-shift schedule since the cut, but will work around the clock when the space shuttle, Columbia, is on a mission. This tracking program from earth will extend through 1984 when the Kokee station is scheduled to close down.

TOURISM

Visitor arrivals to Kauai this year are decreasing faster than they have in either of the past two years, and the end to the decline is not yet in sight. The County administration is supplementing the heavy promotion by the State and the Hawaii Visitors Bureau with its own efforts to turn the situation around for the Garden Island. While County officials are optimistic that their efforts will stem the ebb and increase the visitor flow next year, the figures for this year have been discouraging. For the first eight months Kauai hosted 500,594 visitors, down 8.9 percent from the same period in 1980. The month of July saw a drop of more than 22 percent in arrivals, the worst monthly performance in more than 30 years. This year's declining fortune follows a decrease of 1.5 percent in the number of visitors in 1979, followed by a 5.3 percent drop in 1980. A positive note is that the intended length of stay has averaged 3.5 days so far this year, a factor that has improved steadily over the past decade. Hotel occupancy so far is holding up relatively well despite the large increase in new rooms, helped partly by the longer stays. Occupancy through August averaged 65.6 percent, down from 71.6 percent in the same period last year. Hotel inventory in June was 4,832, up 9 percent from a year earlier, and the opening of the Waiohai in July sent the room count to 5,287 which is an increase of close to 20 percent in a year's time. The visitor plant will continue to grow further in the next few years. The expansion of the Sheraton Kauai Hotel is expected to be completed in November, the Coco Palms Hotel is going to add more rooms to its property, construction of the Marriott Hotel at Princeville is expected to begin in a few months, and a 350-room hotel will go up at Nukolii next year.

With this year being the worst of the three consecutive years of decline in Kauai's visitor industry, the feeling among most of the island's hotel executives is that the bottom has been reached and that there appears to be hope for a slight improvement in 1982. Technically at least, there is room for this view. Not many new rooms will be added to the inventory in 1982, and all the island has to do is to attract approximately the same number of visitors as it did in 1977 to get that slight improvement.

Added to that, the County administration's strong push for tourism may bear some fruit next year. The County participated in a radio blitz in California in August with the other counties and the Hawaii Visitors Bureau, and in addition sponsored extra spots to boost the island. It had a booth at the ASTA convention in Honolulu in September, and is planning another booth at the Japan Association of Travel Agents convention in Tokyo in December. It is participating in these promotions with the private sector. The County also jointly sponsored the Japanese Visitor Appreciation Day in July, as Kauai is the favorite Neighbor Island of Japanese visitors. This will become an annual event. The County is trying to get the Japanese to spend at least one night on the island rather than just coming for the day as most of them do now.

The opening of the Waiohai by Amfac Resorts in July signaled the debut of the new Poipu resort destination area, which will be among the finest in the state. As the island's first luxury hotel, this magnificent property anchors the growing Poipu resort which is spread along the beaches of Kauai's south shore. Next to it is the Kauai Sheraton Hotel, which has nearly completed its expansion program. Mauka of these two properties is Moana Corporation's Kiahuna complex. Its condominium projects makai of Poipu Road are completed, and work has started on its golf course and the first phase of its Kiahuna Golf Village, both mauka of Poipu Road. To the east, ADM International's Poipu Kai resort community is about half complete. These four developments make up the core of the Poipu Beach resort destination area, and the quality is already evident in the layout of the structures, the fine architectural details, and the pleasing landscape design. The major operators have formed an association to jointly promote this new destination area. The Waiohai and Sheraton will have meeting rooms for conventions, Moana will open its golf course in 1983, and all operators will have ample rooms and other amenities for visitors.

The Waiohai has 460 rooms and will employ up to 450. Its conference facilities have 14,000 square feet of floor space, and rank among the best in the state in terms of flexibility and space. The convention hall can seat up to 750 for dinner and can be divided into three separate rooms. There is a large lanai for informal gatherings, and the Koloa wing has seven separate rooms that can be used for seminars, audiovisual presentations, and small meetings. Each can seat up to 100 persons. There are advance bookings for conferences through 1986, and the market appears very promising. The existing Poipu Beach Hotel will be part of the Waiohai complex but will have its own identity. Renovations for this older property have begun, with rooms to be refurbished and a new lobby, shops, and restaurant to be built. Poipu Beach has 142 rooms, giving the Waiohai complex 600 rooms.

Sheraton Kauai's new section will add 230 rooms when it opens in November, giving it a total of 400 rooms. There are six buildings in the new addition including the one that will house the new lobby and administrative office. The new function room will be ready by the first of the year for conventions, its 2,500 square-foot area being able to seat 240 for banquets and 300 for meetings theater-style. The Koa Room in the existing hotel can seat 70 for banquets or 120 theater-style, and the dining room can seat 300 for banquets.

Work on Moana Corporation's golf course got under way during the summer, and the first nine holes are expected to be completed by Christmas of 1982, with the second nine to be finished in the summer of 1983. At the same time, work on 90 single-family lots for Kiahuna Golf Village got under way. They were presold and owners will build their own homes with architectural standards to be set by the company. The second phase of 70 lots will be put on the market next year. The design of the commercial area of the village has been completed, and development may begin next year. Moana, together with Sheraton, Amfac Resorts, and Poipu Kapili, is building a sewage treatment plant that will handle their needs instead of each building its own plant.

Poipu Kai, which broke ground in July 1979, has completed 231 condominium units and sold 53 single-family lots. The last 40 single-family lots went on the market in August. There will be a total of 642 condominium and single-family units in the 110-acre development, so about half of the project has been completed. ADM International, the developer, has sold the Kahala II project of 72 proposed units to Honofed's Home Properties subsidiary. ADM will act as a project manager, and will build and market those units. About a hundred of Poipu Kai's completed condominium units have been placed in a rental pool and are being managed as a hotel by Colony Resorts.

Construction of the first hotel at Princeville is expected to get under way soon, following delays caused by design changes that resulted from high construction bids and time-consuming regulatory requirements. The grading permit for the hotel has been approved and the golf course has also been approved. Site

work is ready to begin. The hotel will be managed by Marriott Hotels. Work on six condominium projects is going on now, and Princeville is preparing to start work on the expansion of its shopping center. The addition will have close to 40,000 square feet of space.

At Wailua, Amfac Resorts is planning to expand its Coco Palms Resort Hotel by building an additional 84 rooms and replacing 60 older rooms with new ones. There has been no decision as to when the work will begin.

The 150-unit condominium project at Nukolii, made up of eight separate buildings, is very close to completion. The developers, Graham Beach Partners of which Hasegawa Komuten (USA) Inc. is general partner, have now started work on the 350-room luxury hotel on the 25-acre resort area. The hotel will be managed by Hilton Hotels Corporation and will be known as the Kauai Hilton. It will open in late 1983. The low-rise hotel will include meeting and conference facilities with a ballroom designed especially for corporate product presentations and exhibits as well as incentive group gatherings. It will have 8,800 square feet of space. There will be other meeting space. The Hanamaulu Beach Resort complex will employ about 265 persons.

RENEWABLE ENERGY

Kauai took a big step forward this year in its drive for energy self-sufficiency with the start-up of Lihue Plantation Co.'s big new bagasse-fueled power generating plant. Testing of the plant began a year ago, and commercial export of power started in February of this year under a 20-year agreement. The plant has a capacity of 20,000 kilowatts of which 12,000 kilowatts are at the disposal of the Kauai Electric Division of Citizens Utilities Co. Lihue officials are very pleased with the better-than-expected efficiency of the power plant. Oil consumption will be less than one-third of the amount originally projected. Kauai Electric officials are also pleased with the new facility. "It is an operational and economic success," says Boyd Townsley, Kauai Electric manager. "The plant's performance has been excellent, and far surpasses what Lihue or we anticipated. They have produced a substantial amount of surplus energy beyond that required by the contract."

Under the agreement, there are three price mechanisms covering 48 weeks of the year, with the remaining four weeks allotted for overhaul of the plant. Lihue must notify Kauai Electric before the harvest begins as to the length of the year's cane-grinding season which must be a minimum of 37 weeks. During this grinding season, Lihue generates power by burning bagasse, and Kauai Electric guarantees the purchase of 55.6 million kilowatt hours of this bagasse-based power, the price of which is based on the price Kauai Electric pays for its fuel oil. Kauai Electric may ask for more power than the 55.6 million KWH annual rate during the grinding season, and a second rate applies which is higher, as the assumption is that Lihue would have to burn oil to generate this extra power. From the end of the grinding season through the 48th week, a third rate applies when Lihue presumably must burn oil to produce power as all of its bagasse would have been used during the grinding season.

During this 48-week period, Kauai Electric has the right to buy up to 96.8 million KWH of power. In addition to this three-tiered price mechanism, Lihue can offer Kauai Electric more power at a lower rate when it has extra bagasse to burn. Kauai Electric may accept it and pay the rate for surplus power.

Kauai Electric also purchases power from Kekaha Sugar Co., Olokele Sugar Co., and McBryde Sugar Co. It has new contracts with the suppliers calling for the surplus rate which moves with the price of oil. Kekaha supplies from 6 to 8 million KWH a year, Olokele about 800,000 KWH, and McBryde, 13 to 14 million KWH. The volume supplied by the four plantations this year will be equal to 35 percent of Kauai Electric's sales. Last year the plantations furnished 12 percent of the utility's requirements. Olokele is installing a new 1,125-kilowatt hydroelectric generator which will supplement the existing hydroelectric plant. It is expected to go into operation early next year, and this will make it possible for Olokele to increase its power export to approximately 6 million KWH annually.

Studies are continuing for other projects that would increase the island's output of power from renewable energy sources. Kekaha Sugar Co. is looking into the feasibility of building a hydroelectric generating plant at Kokee, which would be its third. Other projects include new hydroelectric generation at Lihue and Kekaha, a proposed hydroelectric facility above Wailua, and wind energy.

AGRICULTURE

Firm sugar prices in 1980 pushed Kauai County's agricultural sales volume up 64.2 percent over 1979 to record the second best year in its history. The value of crop and livestock sales amounted to $93.9 million compared with $57.2 million in 1979. The value of harvested sugarcane amounted to $83.6 million, 75.3 percent more than in the previous year, and made up 89 percent of total agricultural sales for the county last year.

Total farm sales for diversified agriculture last year amounted to $10.3 million, an 8.4 percent increase over the $9.5 million reported for 1979. Livestock sales showed a big increase of 30.7 percent to $5.7 million due mainly to a sizable increase in the sale of cattle. However, crop sales dropped 10.7 percent to $4.6 million because of curtailed harvests of vegetables and papaya due partly to damaging winter storms. Seed corn production held its own last year, while the taro crop was a third larger than in 1979, and sales of flowers and nursery products quadrupled.

SUGAR

Kauai's 1980 sugar crop was rather disappointing but the highest prices since 1974 (when sugar was in short supply worldwide) made 1980 the second best year revenue-wise. Winter storms early in the year delayed harvesting for a lengthy period and wet weather also reduced yield. Sugarcane harvested for the year was 1.9 million tons, the smallest crop since 1976, and average yield measured by tons of sugar per acre harvested was also the lowest since 1976. Raw sugar production totaled 223,000 tons, down 4.3 percent from 1979. Average sugar price for the year was $553 per ton, up substantially from the $303 per ton of 1979, and sugar receipts came to $123.4 million. Molasses production was down slightly also, but the average price for the year climbed 21 percent to $87.70 a ton for returns amounting to $5.7 million. The total value of sugar and molasses produced in 1980 was $129.1 million compared with $75.6 million in 1979, an increase of 71 percent.

The weather has been much better in 1981 and the crop will be larger, and the yield much improved. There was a dry period the past summer, but it is not expected to affect this year's or future crops. Every plantation has been affected to some degree by cane smut, and all are converting to a new smut-resistant, high-yielding cane variety developed by the Hawaiian Sugar Planters' Association. Good cultural practices are contributing to the increase in yield, and there may be a substantial improvement in production in the next few years.

Kauai's sugar plantations are also making a significant contribution to the County's effort to reduce its dependence on fuel oil, which is all imported.

Lihue Plantation Co. is a good example of a company adopting industry-developed technology to increase productivity. It is going to lose 650 acres, with most of it already taken, for the construction of the new north-south runway at Lihue Airport by the State. The smaller acreage will reduce its crop by 4,500 tons a year starting in 1981, but it could have been worse. Lihue is getting excellent juices from its sugarcane this year. "Truly a vintage year," says William Balfour, president. The result is that yield through August was almost a ton of sugar per acre above the 9.53 tons forecast, a phenomenal performance. The 1980 average yield for the plantation was 8.49 tons of sugar per acre. Lihue is one-third unirrigated and two-thirds irrigated, so the lower yield compared with irrigated plantations can be deceiving.

To increase yield further, Lihue is planting every field after harvest and doing away with ratoon crops. Balfour, who headed Oahu Sugar Co. up to last year, made that change at Oahu Sugar, and found that a planted field that is drip irrigated yielded a ton and a half more of sugar per acre than a ratoon field. At Lihue, unirrigated plant fields yield a ton of sugar per acre more than ratoon fields. So Lihue becomes the second all-plant plantation in the state. Oahu Sugar's and Lihue's experiences have shown that the cost of ratooning or planting a field is approximately the same when all costs are considered, but the planted field produces more uniform stands of cane, thus increasing yield.

Lihue Plantation's new biomass-fueled boiler and power generating plant began operating a year ago, and commercial exports to the island utility began in February 1981. Efficiency has been greater than anticipated and oil consumption is less than one-third of anticipated use. There was a fear at the beginning that there wouldn't be sufficient biomass fuel, so trash (cane leaves) was put through the milling process to supplement the bagasse. There is sufficient fuel now to generate the volume of power Lihue has contracted to deliver to the utility, and more. Lihue also began an experiment in May with wood chips as fuel for its boiler. Last year's big storm knocked down many eucalyptus trees on State land, and a small company contracted with the State to chip the fallen trees, and is selling it to the plantation. Lihue is using the chips as a 20 to 25 percent mix with bagasse, and this mixed biomass fuel is working out nicely. The wood chip supply will be good for another year.

Kekaha Sugar Co., the westernmost sugar plantation in America, is demonstrating a significant breakthrough in sugar yields. The field superintendent, Hong Ming Hee, credits this to good cultural practices, good sugarcane varieties, drip irrigation, and just as importantly, to teamwork on the plantation. The sugar production forecast for 1981 has been raised three times through August, and now the plantation is looking for a crop of 54,500 tons for the year. Production last year was 48,651 tons. The average yield for 1980 was 12.89 tons of sugar per acre, with the drip-irrigated fields averaging 13.79 tons per acre. The best drip-irrigated field produced 19.85 tons of sugar per acre.

The average yield for 1981 through the third week in August was 13.85 tons of sugar per acre. However, the drip fields harvested so far have produced an average 14.99 tons of sugar per acre with yield ranging from 13.5 to 18.4 tons per acre. The substantial increase is proving that drip irrigation not only conserves a large volume of water but also results in much higher productivity. To further improve this system, Kekaha Sugar is computerizing its drip irrigation system. When completed, the plantation will be able to program the time and duration of irrigation as required by each field, and also of fertilization. From this central control, it can also flush and clean out the system at suitable times.

All of Kekaha's 2,600 acres on the plateau (mauka) fields have been converted to drip irrigation, and a thousand of the 5,400-acre makai fields have been converted so far. All of the remaining acreage will be converted except for a thousand acres that will be irrigated in furrows with water discharged from the factory.

Kekaha Sugar Co. is increasing its electric power output by improvements at its two hydroelectric plants, and is doing a study for a possible third plant. Last year it overhauled the turbine at the hydroelectric plant in Waimea Valley where power output has increased by 20 to 30 percent, with the capacity now at 1,000 kilowatts. It is replacing the generating equipment at its Waiawa hydroelectric plant with new equipment which will increase capacity from 300 kilowatts to 750 kilowatts. Meanwhile, a study is being conducted to check the feasibility of building a new hydroelectric plant in Kokee, using water coming down the plantation's Kokee Ditch before it is used for irrigation.

Olokele Sugar Co. likewise is having a great production year in 1981. The forecast is for a crop of 30,000 tons of sugar compared with 28,500 tons in 1980. Olokele is farthest along in converting to the smut-resistant and high-yielding cane variety known as 62-4671. In addition, weather has been good this year, resulting in good juices. Good weather for juice quality in mature cane is dry weather, but Olokele could have used more water for its growing cane than was available. Olokele has converted most of its fields to drip irrigation which stretches the water supply. Had this efficient irrigation system not been installed, a more severe water problem would have been experienced.

The forcast for this year is for an average yield of 13 tons of sugar per acre at Olokele, up from 12.25 tons last year. Through August the drip-irrigated fields have yielded an average 14 tons of sugar per acre, and the furrow-irrigated fields, 12.3 tons of sugar per acre. In 1980 the drip fields yielded an average 12.4 tons of sugar per acre with the best field producing 15.19 tons per acre, and the furrow fields producing an average 10.4 tons per acre.

Olokele also will be increasing its output of electric power with the installation of a larger generator at its hydroelectric plant. The new turbine will have a capacity of 1,250 kilowatts and will be ready by the end of the year. The old equipment has a capacity of 500 kilowatts. This will make it possible for Olokele to sell a much larger volume of power to the utility.

McBryde Sugar Co. is also having an improved year, with yield rising above that of the past few years. The projection for the 1981 crop is 57,400 tons of sugar, up 2,700 tons over the 1980 crop. The fields harvested through August produced an average 9.22 tons of sugar per acre compared with a yield of 8.59 tons per acre for the entire 1980 crop. The drip-irrigated fields harvested so far have yielded 11.45 tons of sugar per acre, compared with 9.11 tons of sugar per acre for furrow-irrigated fields and 8.09 tons for unirrigated fields. The plantation will complete its conversion of furrowed fields to drip irrigation next year, and will convert some of its unirrigated fields to drip irrigation beginning in 1982 to take advantage of the higher yield.

McBryde Sugar is also changing over to the smut-resistant and high-yielding cane variety known as 62-4671 to replace the 59-3775 variety which constitutes 60 to 70 percent of this year's crop. The smut-susceptible 3775 will be down to 15 percent next year, and completely out by 1983.

With improvements in irrigation and a higher-yielding cane variety, the plantation will begin to see increased production beginning next year, said Richard Cameron, manager.

Sugar prices have been depressed and there is no sign that the situation will improve this year, but costs at the plantation level have moderated considerably for some basic items such as petroleum products and fertilizer.

McBryde Sugar Co. has a new contract with the local utility in which it will supply 10 million kilowatt hours of power or more annually to the utility. Improvements now under way in

the factory will increase the power output by 7 percent which could be used internally or exported. To comply with an EPA rule, a wet scrubber is being installed to cut down on pollutants in the smoke. This, in effect, will increase the efficiency of the boiler and allow it to dry the bagasse further before it is burned, thereby increasing power output.

AQUACULTURE

Amfac Aquatech's experimental prawn farm at Mana has exceeded expectations in the work done to date, and there is a good likelihood that it can be turned into a viable commercial operation. If the company decides to go commercial with the aquaculture project, the prawn operation will be one of the state's largest. A decision will not be reached at least until the summer of 1982, but Aquatech's initial results have shown that prawn productivity can be maintained at high levels, at least in the early stages of growth.

The farm has five nursery ponds, three of them 1 acre each in size and two of them .8 acre each. Then there are 20 production ponds, each one 1.58 acres in size.

Two cultural methods are being tested at the farm. One is a two-phase grow-out system in which young prawns from the hatchery are reared in a nursery pond for three months. Then the pond is drained, the prawns sorted and the number estimated before stocking them in a grow-out pond. The adults are harvested regularly, and the pond is restocked quarterly. The other is a three-phase operation in which the prawns from the nursery pond are transferred into a pond of intermediate density. At four months, the pond is drained and prawns are size-graded and transferred to other ponds, which are then cull-harvested. After six to eight months, the ponds are drained again and prawns of marketable size are sent to the processing plant and the remainder put in a pond for further growth. This is semi-intensive culture.

At the nursery and intermediate stages, production has been at a level of 3,000 pounds per acre per year. This was achieved through careful stock management. The company purchased the prawn hatchery formerly operated by C. Brewer and Co. in Hanapepe, which supplies the farm. Feed conversion in the first two stages of development has been better than two and a half to one, but Aquatech still has to prove this very favorable ratio in the final grow-out phase, says Rick Gibson, who heads the entire effort. The company is testing three different feeds, using them in various formulated diets. Evaluation of sugarcane trash as a source of carbon for the prawns will begin before the end of the year. Gibson said that research has shown that prawns can convert cellulose into nutrients like cattle.

The processing plant, fully operational but not yet fully utilized, has been testing the processing line and various flash-freezing and packing methods. Aquatech has developed a process that will maintain the shelf life of the frozen prawns for more than a year.

In Kilauea, the island's only established prawn farm—Prawns of Hawaii Inc.—is doing well, both in the production end and in marketing. Unable to supply the demand, the company has decided to expand its production area by leasing additional acreage. A $75,000 State agricultural loan has been approved, and work will begin after the lease arrangements are completed. The farm now has 24 acres of water surface, most of it in one-acre ponds. Ten more acres of water surface will be added, part of which will be nursery ponds to nurture the young prawns from the hatchery. When they reach about two inches in size, they will be transferred to grow-out ponds.

The farm now requires about 1.2 million baby prawns annually which the State hatchery had agreed to supply under their cooperative agreement. However, the hatchery has been unable to increase production sufficiently to fulfill the needs of prawn farms under contract, and Prawns of Hawaii has had to purchase substantial stock from a private hatchery. The farm is doing much better in marketing its production, with shipments to the Mainland now equal to those shipped to clients in the islands. Mainland shipments are mainly to Los Angeles, New York, and Boston.

GUAVA

Guavas became a million-dollar crop last year for the first time, taking a big leap from previous years as state production exploded. The total amount processed in 1980 was 9.9 million pounds including 2.3 million pounds of wild guavas. This was a 53 percent increase over the 6.5 million pounds processed in 1979. With the average price up 1.8 cents to 11 cents a pound in 1980, the value of the crop was $1.1 million compared to the $593,000 that growers and pickers received for the 1979 crop.

C. Brewer & Co.'s Kilauea Agronomics subsidiary is rapidly becoming, if not already, the state's biggest producer of this tropical fruit. At the end of 1980, it accounted for one-third of the 975 acres planted in guava trees in the state, and it is adding more acreage this year to bring its orchard up to 350 acres. The trees are young, and production doesn't compare to that of more mature orchards. Kilauea's first plantings are four years old this year, but yield has been surprisingly heavy. The University of Hawaii estimates that guava trees in their fourth year bear around 9,000 pounds per acre, but the yield at Kilauea has been 18,000 pounds per acre, far beyond the company's projection. The forecast for this year's crop is more than 2 million pounds, up from 700,000 pounds last year.

Kilauea Agronomics has a new fruit processing plant in Kilauea where puree can be flash-frozen to maintain quality for long periods. It has sufficient capacity to process all of its production so far, but not enough freezer capacity, so part of its harvest has to be processed at Hawaiian Fruit Preserving Co., in Kalaheo.

Most of the guava puree used today is for juice or nectar. In its guava marketing effort, C. Brewer & Co. is working on new product development in anticipation of the day when guava production is many times more than it is today.

Meadow Gold, a major marketer of guava juice in Hawaii, has successfully invaded the Southern California market with this product. Starting a few years ago, it began promoting guava juice in cartons. The product finally has established itself and sales are increasing rapidly in the greater Los Angeles area. Marketing has now been expanded to other areas in California, and Meadow Gold has decided to begin penetration of some of the mountain states such as Utah, Idaho, and Colorado.

Kilauea Agronomics has been searching for a less costly way to ship its puree to the Mainland, and aseptic packaging was thought to be the answer. However, studies at the University of Hawaii showed that shelf life would not be extended long enough, and the loss of color in the aseptic processing made it unacceptable. Studies will continue in seeking to find a more acceptable solution.

Over at Kalaheo, Hawaiian Fruit Preserving Co. is working at capacity processing part of Kilauea Agronomics' guava crop while keeping up with demand for its own products. The freezing capacity is the bottleneck, a result of insufficient compressor power. The freezer box holds 500,000 pounds but can freeze only 100,000 pounds of puree at a time. C. Brewer has been able to market the puree rapidly, and the fast turnover has made it possible for Hawaiian Fruit to process 35,000 pounds of Kilauea guava three days a week. The demand for Hawaiian Fruit's own guava products from jams and jellies to syrups and juices has been very good.

PAPAYA

Kauai's 1980 papaya production was better than expected with heavy yield in the second half following a winter storm that cut down the early harvest. Production for the first half was 7 percent below the 1979 pace, but the whole year's crop was 6.1 million pounds, 7.5 percent more than 1979 production. However, average price for the year was down substantially, and total receipts to growers were down accordingly. Receipts for the 6 million pounds shipped as fresh fruit totaled approximately $1.2 million, down about 18 percent from 1979, although fresh shipments were up around 10 percent.

Production in 1981 has been at a high level all year through July, and Kauai will likely see a new crop record, barring any catastrophe. The weather has been good this year, and the harvest through July at 4.1 million pounds, was 31.7 percent more than for the same period in 1980. The production of 735,000 pounds in July was a record monthly harvest for Kauai, and production was expected to increase over the fall months. The strike of tugboat workers in late August disrupted barge shipments throughout the state but papaya shipments were not affected too badly as Kauai growers had sufficient air cargo space to Honolulu, from where the fruit is transshipped to the Mainland.

Best Fruits, Inc., which packs, ships, and markets the papaya for almost all of Kauai's growers, expected to have excess fruit on hand due to the sharp increase in production this year. But its manager, Joshua Hew, said the demand has been phenomenal, and the market has absorbed all that their growers have been able to produce. The result has been record shipments to the Mainland from February through May so far. He believes the reasons for the active sales are Safeway's tropical fruit promotion during April, *Sunset* magazine's featuring the sunshine (pink) papaya produced on Kauai in its May issue, promotion by the Papaya Administrative Committee, and the Beverly Hills diet that featured papaya earlier in the year.

At one time, Best Fruits served the Moloaa Papaya Cooperative exclusively, but it has added several other growers in Koolau and Kilauea in the past two years. The total acreage planted to papaya by its growers is now 600, with 100 acres having been planted in the past year. It is expecting its growers to produce a 10- to 12-million pound crop in the next year or two. In anticipation of that increased production, Best Fruits has improved and increased the capacity of its packing line, has installed a monorail system for the hot water treatment of the fruit, and will install a larger heat exchanger before the end of the year. These improvements will cost the company $50,000.

Kauai County Statistics

	unit	period	1976	1977	1978	1979	1980	8 mo.* 1981	% change 8 mo.* 1981/1980
Population, Resident	number	July 1	35,200	36,200	37,000	38,100	39,300p	40,200 e	2.3
Per Capita Personal Income	dollars	total	5,762	6,683	7,147	7,762	n.a.	n.a.	—
Civilian Labor Force	number	mo. avg.	17,150	17,900	17,600	17,550	17,750	17,700p	0.3
Employment	number	mo. avg.	15,550	16,700	16,400	16,550	16,900	16,650p	1.5
Unemployment	number	mo. avg.	1,600	1,150	1,200	1,000	850	1,100p	22.2
Unemployment Rate	percent	mo. avg.	9.4	6.5	6.9	5.6	4.9	6.1p	22.0
Total Job Count[1]	number	mo. avg.	16,250	16,100	16,650	17,200	17,700	17,200p	2.5
State Tax Collections	thous. $	total	20,903	22,379	25,858	25,962	34,789	17,318 **	1.5**
Total Bank Deposits	thous. $	end per.	97,882	109,809	123,682	139,601	156,029	171,371	16.0
Debits to Demand Deposits	mil. $	total	577.7	633.7	775.2	965.1	1,132.2	747.1	-0.1
Private Residential Permits	thous. $	total	13,346	21,197	49,006	100,024	74,786	30,899	30.5
Single Family Units	number	total	321	445	565	512	377	225	4.6
Multi-Family Units	number	total	4	83	623	1,169	793	118	-70.6
Private Non-Residential Permits	thous. $	total	3,755	6,822	7,711	13,896	58,299	16,064	-11.6
Public Contracts Awarded	thous. $	total	14,310	11,364	10,196	13,537	10,938	14,142	212.6
Federal	thous. $	total	2,571	428	3,349	440	529	140	-43.3
State	thous. $	total	7,684	5,628	2,627	8,618	2,179	11,468	529.3
County	thous. $	total	4,054	5,308	4,180	4,447	8,224	2,544	3.6
Estimated Westbound Visitors	thous.	total	699.3	740.5	837.7	825.4	781.4	500.6	-8.9
Intended Length of Stay—Westbound	no. of days	mo. avg.	2.85	2.97	3.08	3.29	3.40	3.51	2.6
Hotel Inventory	number	June	3,724	3,863	4,097	4,064	4,435	4,832	9.0
Hotel Occupancy	percent	mo. avg.	76.8	80.6	83.3	76.5	69.0	66.6	8.4
Electricity Generated	mil. KWH	total	170.0	183.2	201.0	204.2	211.1	144.0	4.1
Telephones in Service	number	end per.	22,073	23,576	25,692	27,411	29,274	30,609	6.3
Motor Vehicle Registration	number	total	25,300	26,920	27,614	29,492	30,604	n.a.	—
Sugar Production, raw sugar 96°	thous. tons	total	217	232	223	232	223	157	2.7
Diversified Agriculture	thous. $	total	5,274	6,461	7,432	9,489	10,286	n.a.	—
Crops	thous. $	total	2,291	2,871	3,119	5,113	4,565	n.a.	—
Livestock	thous. $	total	2,983	3,590	4,313	4,376	5,721	n.a.	—

e = estimated
p = preliminary
n.a. = not available

**except population (July 1) and hotel inventory (June)*
***Excludes property taxes which were formerly collected by the State but are now collected by the County.*

[1]Refers to number of jobs rather than number of persons employed. Persons with more than one job are counted more than once.